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22 January 1981

USSR Report

ENERGY

No. 46

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ELECTRIC POWER

CEMA MEETING ON FUTURE OF POWER ENGINEERING

Kiev PRAVDA UKRAINY in Russian 26 Oct 80 p 3

[Article: "Power Engineers Meet"]

[Text] The fifty-seventh session of the standing CEMA commission on electric power was held in Moscow and Zaporozh'e from the 20th through the 24th of October. Delegations from the CEMA nations - Bulgaria, Romania, East Germany, Cuba, Mongolia, Poland, Hungary, the USSR, Czechoslovakia, as well as Yugoslavia, specialists from the Central Dispatch Administration of the Unified power systems of the CEMA member nations, and representatives of the international economic association Interatomenergo [International Nuclear Energy Association] - participated in the work of the commission.

Important questions connected with the solution of crucial problems in the further development of power engineering in the CEMA nations were studied during the session, according to the deputy minister of power and electrification, USSR, and the deputy chairman of the standing CEMA commission on electric power, N.A. Lopatin, in an interview with a correspondent from RATAU [Ukrainian Radio and Telegraph Agency]. The participants in the session were unanimous in their support of the fruitfulness of the cooperation in this important area of the economy, the effectiveness of realizing long-term target programs for the comprehensive use and development of the energy potential of the CEMA nations. Satisfaction was expressed over the successful completion of the unified general plan for the development of power systems in the European CEMA nations, which was approved at the session by the heads of state.

The participants in this meeting devoted considerable attention to the rapid development in all CEMA nations of nuclear power and the organization of the mass construction of nuclear power stations (AES). They gained knowledge about the construction of AES by visiting the site of the Zaporozh'e nuclear power station. It was emphasized that prior to 1990 in the European socialist nations nuclear power stations will be built, which have a total capacity in excess of tens of millions of kilowatts. A decision was also made to hasten the construction of highly efficient water storage stations in several CEMA nations.

In the protocol that was signed by the commission it speaks about the realization of a general accord on cooperation by several CEMA nations in the building of the Khmel'nitskiy nuclear power station and the high voltage transmission line from the Khmel'nitskiy nuclear power station to Zheshuv (Poland). Discussion was devoted to the readiness of national power systems for the present fall and winter maximum loading and a set of additional measures for increasing the reliability of the parallel operation of the CEMA Unified power system was drawn up.

The CEMA delegations were acquainted with the operation of the Beloyarsk AES, the Zaporozh'e GRES, and they visited the Dneproskiy GES imeni V. I. Lenin.

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ELECTRIC POWER

GEOTHERMAL PROSPECTS OF ARMENIA

Yerevan IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR. NAUKI O ZEMLE in Russian No 3, 1980 pp 29-33

/Article by E.I. Boguslavkiy, T.A. Tarabarinova, R.S. Malkhazyan, Leningrad Mining Institute imeni G.V. Plekhanov and ArmNIIE (Armenian Scientific Research Institute of Economics): "Prospects of Tapping the Petrogeothermal Resources of the Armenian SSR"/

/Text/ A preliminary evaluation of the economical feasibility of tapping petrogeothermal resources in the Armenian SSR has been completed. Their thermal potential is nearly 300 billion tons of standard fuel and covers nearly 80 percent of the entire republic. According to an evaluation of the scale on which petrogeothermal resources could be used, they could replace .7 million tons of standard fuel in 1990, 1.3 million tons in 1995 and two million tons of standard fuel in the year 2000 of Armenia's fuel and energy balance.

The unavoidable depletion of supplies of traditional kinds of fuel, the worsening of natural conditions of their distribution and a rise in costs for extraction are leading steadily to a rise in energy costs and an increasing shortage. In these conditions there is no doubt but that we should devote attention to the use of geothermal energy. We have known for a long time about geothermal energy, but it is still relatively unused.

The basic potential of the thermal energy of the upper layers of the lithosphere (to a depth of 5 to 7 kilometers) is accumulated in the rocks (hard phase). That portion of the potential which can economically be extracted at the present stage of technology and condition of the economy comprises the category of petrogeothermal resources.

Armenia's power system presently consists of a complex of electric power stations, condensation, hydraulic and thermal electric power plants and a nuclear power station.

All subsequent review of energy resources is restricted to mineral and nuclear fuels, which the republic does not have in significant amounts.

Water resources are limited. It follows that there should be a comprehensive scientific-technical program devoted to the problem of creating an energy base in the Armenian SSR.

The inclusion of a new source of energy in Armenia's fuel and energy base is of particular importance.

In Armenia's national economy petrogeothermal energy, with its various temperature potentials, can be used in three basic spheres of energy consumption:

a) in supplying heat to industrial and agricultural facilities; for example, in the chemical industry with potentials of 150 to 90 degrees C, in hothouse farming (90 - 30 degrees C), in fish raising (30 to 20 degrees C) and in other areas; b) in supplying heat to industrial organizations and housing units (110 - 90 degrees C); and c) for the production of electric power (more than 150 degrees C).

Based on geothermal research (the Institute of Geological Sciences of the Armenian SSR Academy of Sciences and the Geological Administration of the Armenian SSR *) that was conducted within the Armenian SSR, four basic geothermal regions have been isolated:

1. The Central (Armenian) Region, within which the thermal flow is more than two megacalories per square meter per second and the geothermal gradient is approximately 5 degrees C per 100 meters. This region is confined to the Miskhano-Zangezurskiy geological-structural zone.

2. The North Eastern (Lesser Caucasus) Region, where the thermal flow changes from .7 to 2 megacalories per square meter per second and the geothermal gradient is from 1.5 to 4.3 degrees C per 100 meters. It is confined to the Pre-Lesser Caucasus Somkheto -Karabakhskiy and Lake Sevan area geological-structural zones.

3. The South Western (Priaraksinskiy) Region with a thermal flow of .8 to 1.8 megacalories per square meter per second and a geothermal gradient of 1.5 to 3.3 degrees C per 100 meters. It encompasses the Yerevan-Ordubadskiy, Priaraksinskiy and Kafanskiy techtonic zones.

4. The Southern Region, where the geothermal gradient reaches 4 degrees C per 100 meters.

The territorial geological-economic evaluation of feasible petrogeothermal resources and the regionalization of the resources according to the economic effectiveness of extraction make it possible to determine the accessible energy potential and to identify the regions, in which this form of energy can compete with traditional resources and then to select the sectors for the initial construction of experimental and industrial petrogeothermal systems. The methodology for such an evaluation was developed in the Leningrad Mining Institute under the supervision of Professor Yu. D. Dyad'kin. **

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* Research and evaluations of A.T. Aslanyan, corresponding member of the Armenian SSR Academy of Sciences and candidate for the degree of geological and mathematical sciences and R.T. Miridzhanyan, candidate for the degree of geological and mathematical sciences, M.P. Khodzhoyan and others.

The temperature range of petrogeothermal resources is quite broad - from 30 to 150 and more degrees C. In the initial evaluation of the territory of Armenia, 100 degrees C was used as the lower limit of the temperature potential; this is the average temperature of a heating supply system. This approach did not take into consideration the low temperature resources of the earth's interior heat and reserves a very substantial thermal potential. In addition, the evaluation did not include the petrogeothermal resources which can supply a very economical source of electric power.

An overall evaluation of Armenia's perspective petrogeothermal resources is presented in Table 1. Moreover, in view of the lack of geothermal information no consideration was given to areas in the Aniyskiy, Arkiksiy, Talinskiy, Oktemberyanskiy and other regions with a total area of nearly 4,000 square kilometers. The cited costs for extracting the thermal energy of the earth's interior (Cp) were based on the results of an economic-mathematical modeling of the petrogeothermal systems. The maximum cost of electric power - 9 kopecks per kilowatt-hour - was used for the estimate. The cited costs for an alternate source (Ck) - a boiler at 50 gigacalories per hour with the prepaid price for coal at 24.7 rubles per ton, or 44.9 rubles per ton of standard fuel - was 9.8 rubles per gigacalory. As the estimates demonstrated, the efficiency coefficient for assimilating petrogeothermal resources $K_e = \frac{Ck}{Cp}$ within the Armenian SSR changes from 1 to 5. In other words, the cost of extracting the heat of the earth's interior is, in the worst case, equal to the burning of traditional fuel and, in the best case, it is five times cheaper.

Total, economically feasible petrogeothermal resources, according to a 1978 estimate, have a thermal potential equivalent to 315 billion tons of standard fuel. These resources are available to 78.5 percent of the republic's territory; if we include the areas that were not evaluated, then petrogeothermal resources are available to 90.7 percent of Armenia's territory. In regions with a high efficiency coefficient, the relative depths for developing petrogeothermal deposits (Ke = 1) are 5.5 to 5 kilometers; moreover, the temperatures of the rock reach 200 to 250 degrees C.

** In addition to Yu.D. Dyad'kin and the authors of this article, A. B. Vaynblat and Ye.A. Solov'eva participated in the development of this methodology.

Table 1: The Petrogeothermal Resources of the Armenian SSR

Regions	Geothermal gradient, C degrees per 100 meters	Depth of isotherm, degrees C 100 per km	Cited costs for heat from system, rubles per Gcal	Efficiency coefficient	Temp. of rock at relative depth, degrees C	Area, thousand of square km	Resources	
							10^{15} Kcal	Billions of tons of standard fuel
North-East	2.1	4.7	9.0	1	103	3.0	11	2
	2.9	3.4	4.0	2	142	3.6	189	27
Central	4.0	2.5	2.6	4	196	6.8	847	121
	5.0	2.0	1.8	5	245	2.8	546	78
South-Western	2.1	4.8	9.0	1	103	1.3	3	--
	2.9	3.4	4.0	2	142	1.8	97	14
Southern	4.0	2.5	2.6	4	196	4.1	510	73
TOTAL						23.4	2266	315

Similar calculations were done on the conditions for obtaining thermal energy with a potential of 150 degrees C. They demonstrated that for 46 percent of Armenia's territory one can efficiently extract petrogeothermal resources with a sufficiently high temperature potential to more than meet the needs for the industrial utilization of heat and to generate electric power.

The coefficient for the extraction of thermal energy when developing a petrogeothermal deposit by means of circulating systems with artificial filtration zones, which are formed by fissures in the hydrofracture, amounts to .1 to .3; in natural collectors it may reach .4 to .5. Taking the average value of the coefficient as equal to .25, one can estimate the value of the economic savings in the petrogeothermal resources to be extracted in Armenia: it amounts to 79 billion tons of standard fuel.

The estimates that were made are based on the prices that were in effect during this period. However, the prices for fuel are rising, significantly surpassing the increase in costs for building the systems. This will undoubtedly lead to an increase in the perspective petrogeothermal resources.

The industrial assimilation of new fuel and energy resources is always connected with significant capital investments and is usually done in stages. The extraction of petrogeothermal resources initially requires that geological and geothermal research be conducted and that experimental and experimental-industrial systems be built. By allowing nearly ten years for this work and figuring the acute shortage of energy in the republic, one can predict that petrogeothermal resources will be in use extensively starting in 1990.

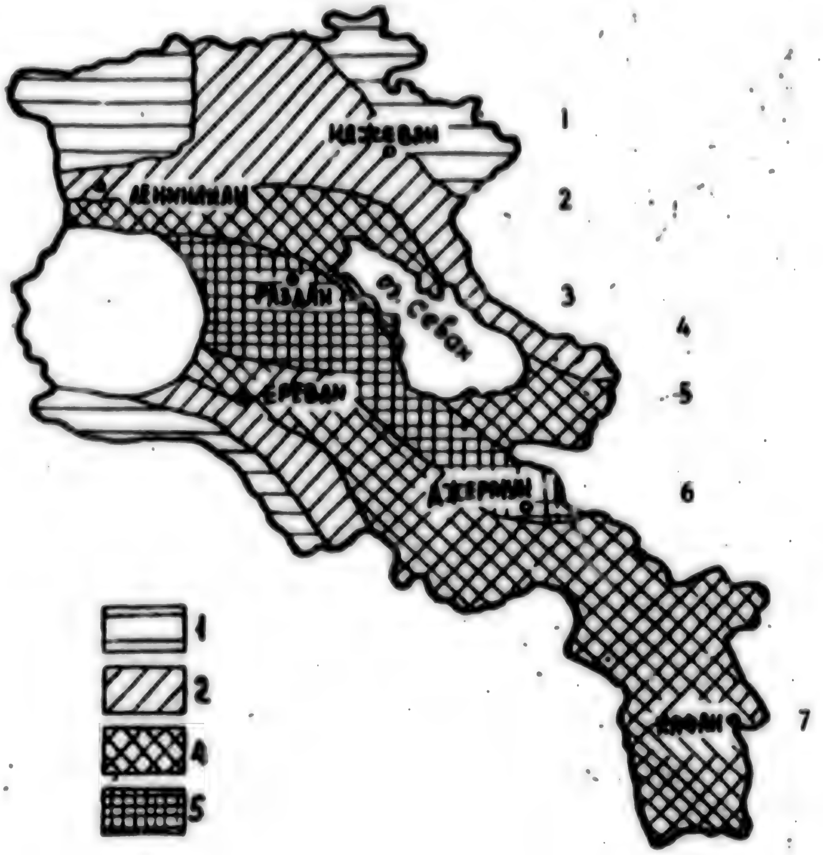

Figure 1. The Petrogeothermal Resources of the Armenian SSR.

1,2,4 and 5 - Indicators of the coefficients of the economic savings $\frac{Ck}{Cp}$ by region. (Key: 1. Idzhevan, 2. Leninakan, 3. Razdyan, 4. Lake Sevan, 5. Yerevan, 6. Dzhermuk, 7. Kafan.)

The estimate of the possible scope for including petrogeothermal resources in Armenia's fuel and energy balance was based on forecasts for the development of Armenia's national economy for the long term. Moreover, for the Twelfth Five-Year Plan it is projected to replace only the fuel that is burned in boilers and to then add this to the total growth in heating loads, including the production of thermal energy in heating and electric power plants.

The amount of thermal energy that can replaced by petrogeothermal resources can be determined by using the proposed method of effective area. It amounts to 5.1, 8.9 and 13.6 million gigacalories per year, i.e., 730, 1,270 and 1,940 thousand tons of standard fuel per year in the forthcoming five-year plans. To cover these thermal loads it is necessary to put 34 unit cells of circulating systems into operation. Each such cell with a thermal capacity of 25 gigacalories per hour consists of two wells which span six to ten fissures of the hydrofracture.

The capital investments for its construction are compiled on the basis of the depth of the zone of heat exchange from 1.5 to 3.5 million rubles; and the cited costs for extracting the heat of the earth's interior is from 2.2 to 4.5 rubles per gigacalory. An additional six cells must be put into operation for an industrial heat supply system and 19 cells are needed for domestic use; 15 and 16 cells are needed later, respectively.

A petrogeothermal system can be formed from one, two, three and more unit cells. It is necessary to drill 85,000 meters of wells, which requires the work of nine machine tools over a five-year period; the capital investments needed during this time period for construction will amount to 13.4 million rubles per year, with a total cost of nearly 70 million rubles.

The national economic savings in the first of the planned five-year plans will exceed the annual capital investments by more than double; in subsequent five-year plans the savings will reach 54 and 80 million rubles per year against capital investments of 10 and 12 million rubles per year.

The evaluation has once again offered convincing evidence of the urgent need to commence a broad range of work to assimilate the petrogeothermal resources within the Armenian SSR. To accomplish this it is necessary to draw up a republic program, which includes:

a) the geological and geothermal research and exploration in the prospecting and mapping of petrogeothermal deposits;

b) the construction of an experimental circulating system by 1985;

c) the construction of nearly ten experimental-industrial and industrial petrogeothermal systems by 1990;

d) in the years 1190-1995 to fully replace fuel that is burned in boilers to meet heating supply needs.

In addition, and perhaps most important, to carry out experimental-industrial work by 1990 and by the year 2000 to complete the installation of the first unit of a powerful petrogeothermal power station.

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ELECTRIC POWER

SOVIETS HARNESS THE WIND

Moscow NEDELYA in Russian No 43, 20-26 Oct 80 pp 4-5

/Article by B. Sadekov, special correspondent for NEDELYA, Astrakhan': "Cyclone in a Harness"7

/Text7 Once I spent an entire day at a mill in the Estonian countryside. I sat on a little rise looking at its vanes; I went inside and was enthralled with its millstones. The wooden blades turned slowly, creaking and the millstones ground the grain. There was no need for barrels of fuel, a diesel engine, generator nor for greasy special clothing. The birds chirped and the air was clear and fresh. It smelled of things near and far. The wind, man's old and disinterested helper, was working for man.

In Astrakhan' is the "Wind Power Machine Building" Plant, the only enterprise in the Soviet Union that manufactures wind power equipment with the symbolic designation "Cyclone". Naturally they are similar in principle to wind mills, however they are made of metal and only have two blades. Of course, "Cyclones" will not replace atomic and hydraulic electric power stations, but specialists are convinced that the more powerful "Cyclones" can compete with diesel engines. Just three years ago, the Wind Power Machine Building Plant was reequipped and enlarged from a small repair plant. It then began manufacturing its first-born - the "Cyclone-3", which is a very simple mechanical wind power installation that is used only to draw water from artesian wells. In this "Cyclone" the inertia pump was most important part; it produced one kilowatt of power. Still it provided water for two flocks of sheep (nearly 2,000 head) or up to 200 cows.

Now on the testing grounds of Baku and Alma-Ata and on the Markhotskiy pass near Novorossiysk they are testing the "Cyclone-6", which is a considerably more powerful unit. Vetroenergomash has produced a so-called series batch of these "six cyclones": more than 160 wind units are already working in various regions of the Soviet Union. The new "Cyclone" is much improved. Supplied with a generator, it operates as an independent electric power station, providing light and heat to entire settlements of fishermen, hunters, geologists, livestock tenders; it charges batteries and protects pipelines from erosion and wandering currents and desalinates sea water.

The director of the Vetroenergomash Plant, Georgiy Vasil'evich Maksimenko, and the chief engineer, Anatoliy Fedorovich Vlasov, showed me an order that told where the "Cyclone-6" is now being used: in the construction of waterways in Kazakhstan, Uzbekistan and Armenia; in the battle against hail in Moldavia, at rest and relaxation bases in Leningrad Oblast, in oil and gas prospecting on the Yamal peninsula, at fishing and trapping organizations on Vrangel' Island and Nar'yan-Mar. Nineteen "Cyclones" are ready to be shipped to Sakhalin and Kamchatka. The orders keep coming in.

The series of new wind units was developed by the scientific-production association "Cyclone". The very latest achievements in electronics, machine building, aerodynamics and automation were taken into consideration. The service life of these units is ten years.

The "Cyclone" starts to turn when the wind reaches 5 meters per second, according to the plant managers. The optimal wind is 7 - 10 meters per second. An automatic regulator in the "Cyclone" maintains a constant number of revolutions.

And in a hurricane force wind?

In a hurricane the unit shuts down.

If there is no wind at all?

In principle, there is always wind. But if there is no wind, then we have taken care of that, too. When the electricity is not needed for some purpose, it can be stored in a battery and used later. How much can be stored? That depends upon the capacity of the battery and the amount of time for the charge.

The engineering concept moves forward. In the Eleventh Five-Year Plan the Vetroenergomash Plant will switch to the production of even more powerful units - the "Cyclone-12" (up to 18 kilowatts) and the "Cyclone-18" (up to 30 kilowatts). Experimental models have already been manufactured. These units can completely replace diesel-generator units, which require few service personnel and fuel. "Cyclones", while work in conjunction with diesel-generators, save 75 percent of fuel. The blades of the new "Cyclones" - the helicopter type - are six meters in length. The "Cyclone-12" will be able to provide electricity to electric pumping stations with an economic savings of up to 20,000 rubles per year, to irrigate croplands. The "Cyclone-18" will be used as an electric power station supplying electricity to populated areas that have not yet been incorporated into power systems. In regions that have an average annual wind speed of 8 meters per second, the cost of the production of a kilowatt-hour of electricity does not exceed 1.6 copecks.

The largest "Cyclone-24", with a capacity of up to 100 kilowatts, is now being readied for operation. This unit will be manufactured at the new Vetroenergomash Plant, the construction of which will begin in the near future (it will be right next to the existing plant; the design work is coming to an end). It will produce more than 20,000 "Cyclones" per year.

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ELECTRIC POWER

BRIEFS

KRASNOARMEYSK COAL MINES CRITICIZED--The Miners at one of the largest associations in the Donbass (general director P. Bigma) are chronically disappointing fuel consumers. By fulfilling their production assignments by 94 to 95 percent, they have owed more than one half million tons of coal since the start of the year. Out of eleven mines only the "Central" mine is keeping up with the plan. Among those lagging behind is the large mine imeni Stakhanov, which is a new and promising enterprise. It has been in operation for more than three years but still has not reached its planned capacity. We must also name the collective of the mine imeni Dimitrov as among those lagging behind. The mine imeni Shevchenko, which has been equipped with antiquated widespan equipment, is also in a bad situation. Officially, the management of the Krasnoarmeysk Coal Association explain the lag as the result of a worsening in the mining and geological conditions and a shortage of new productive equipment. This, of course, is partly true, but their own miscalculations are more responsible. The tunnelers are not doing a good job in the mines and there is no stockpile for cleaning work. There are frequent violations in technology and safety practices; and there are frequent emergency shutdowns in production. Since the start of the year there have been 300 accidents at the mine imeni Shevchenko alone. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Oct 80 p 3] 8927

ESTONIAN SCIENTISTS STUDY THERMAL ENERGY--Since the extensive inclusion of oil shale in the Soviet Union's energy balance, which was largely the result of successful research performed by Estonian scientists, one hundred million tons of high quality standard fuel has been saved. This report was given to a correspondent of the Estonian Telegraph Agency by Academician I. Epik of the Estonian SSR Academy of Sciences in connection with the Third All-Union Conference on the influence of the mineral portion of energy fuels on the operation of electric power station steam generators. The conference got underway on 22 October in the city of Tallinn. Representatives of seven socialist nations and Finland are participating in the scientific forum. I. Epik said that the choice of the Tallinn polytechnical institute as the place to hold the conference was no accident. The Tallinn Polytechnical Institute has earned the right to become one of the centers for the study of energy fuels. The results of the research of the institution's scientists are being effectively used in industry and at Siberian electric power stations. The systems for cleaning the heating surfaces of steam generators, which they developed, make it possible to save nearly one million rubles at electric power stations having a capacity of one million kilowatts. The efforts of the scientists and thermal power engineers are now directed at building powerful energy producing boilers and to more extensively incorporate solid fuels in the energy balance. This will make it possible to save liquid fuel to better meet other needs of the national economy. [By C. Kalabin] [Text] [Tallinn SOVETSKAYA ESTONIYA in Russian 23 Oct 80 p 4] 8927

HAWAIIAN ELECTRIC POWER STATION --In the Hawaiian Islands construction is uderway of a geothermal electric power station, which will use hot water from the depths of the active Kilauea Volcano. This is one of the highest volcanoes in the world - 1,247 meters above sea level. The temperature of the water in the underground reservoirs reaches 300 degrees Centigrade. Since the pressure is very high, the water does not boil. Then, as it reaches the surface, it is converted into superheated steam, which can be successfully used in turbines. [Text] [Moscow ZHILISHCHNOYE I KOMMUNAL'NOYE KHOZYAYSTVO in Russian No 8 Aug 80 p 21] 8927

COAL MINING IN KIRGHIZ--In Sulyukta, Kirghiz SSR, miners are increasing their use of the open-cut mining method for extracting coal; this method is the most inexpensive. Today the "Twelfth Field" open-pit coal mine, which is one of the largest in Middle Asia, began operating. Its capacity is nearly one and a half million tons of solid fuel per year. [Text] [Moscow PRAVDA in Russian 16 Oct 80 p 1] 8927

TYUMEN' PETROLEUM PRODUCTION--The flow of high quality petroleum from the Fedorovo deposit near Surgut in Tyumen' Oblast has increased significantly. Specialists from the USSR and the GDR have joined together in building a large installation for preparing liquid fuel for transport. The installation's capacity is 3.5 million tons of raw material per year. Before it reaches the main pipeline, the oil is cleansed of water, salt and other impurities. The enterprise plan was developed by the USSR and the GDR manufactured the equipment and structures. Specialists from the GDR found effective ways to ensure the steady supply of equipment to Siberia. [Text] [Moscow IZVESTIYA in Russian 10 Oct 80 p 3] 8927

MOLDAVIAN GRES--The twelfth unit of the Moldavian hydroelectric power station (GRES) has been given an industrial load. This means that one of the largest power stations in the southern USSR now has a capacity in excess of 2,400,000 kilowatts. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Sept 80 p 2] 8927

NEW TYUMEN' OIL FIELD--In Tyumen' Oblast the industrial exploitation of the new Yaunlorskiy oil deposit has started. This the twenty first deposit to be put into operation since the start of the five-year plan. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Sep 80 p 2] 8927

BELOZERNYY GAS REFINERY--Workers have taken their places at the panels of the Belozernyy gas refinery, which was built at the Samotlor deposit. Each year they will process up to two billion cubic meters of fuel. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Sep 80 p 2] 8927

KURPSAYSKAYA GES--At the Kurpsayskaya GES, which is being built on the Naryn River, work has started on the installation of the spiral chamber of the first unit. Work is ahead of schedule. In honor of the 26th CPSU Congress, the workers have decided to put the turbine into operation ahead of schedule, by the 21st of February 1981. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Sep 80 p 3] 8927

HIGH-VOLTAGE POWER LINE--A 750 kilovolt high-voltage electric power line has been put into operation. The line connects the Chernobyl' atomic power station with the Western Ukrainian substation. This means an improved supply of power to the western oblasts of the Ukraine, where in accordance with decisions of the 25th CPSU Congress several large industrial enterprises have been built. Supplies of electric power to European nation-members of CEMA have also been increased. [Text] [Moscow IZVESTIYA in Russian 26 Oct 80 p 1] 8927

PREOBREZHENKA OIL DISCOVERY--Drillers in the brigade headed by foreman V. Kukarin of the Vostsibneftgazgeologiya Association [East Siberian Oil and Gas Geological Prospecting Association] have prepared a worthy gift for the 63rd Anniversary of the October Revolution and the 26th CPSU Congress. At the Danilovskiy sector near the village of Preobrazhenka at a depth of 1,600 meters they have struck a large gusher of oil. The well production rate is 100 tons of fuel every 24 hours. The geologists, geophysicists and drillers of the association have worked several years toward this great labor victory. By Yu. Shumaylov. [Text] [Moscow] SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Oct 80 p 1] 8927

RYAZAN' GRES NEW TURBOGENERATOR --At the Ryazan' GRES the installation of a superpowerful 800,000 kilowatt turbogenerator has been completed. This generator, in contrast to its predecessors, is cooled by water rather than hydrogen, which has made it possible to considerably reduce its size. The unit, which generates a capacity greater than the old Dnepr GRES , cannot even be seen on the enormous turbine. The gigantic boiler, which yields 1,600 tons of stean per hour, is equipped with a special fuel device. A special tractor trailer was designed to deliver the unique transformer-"millionnik". The builders and installers of the superpowerful power unit, which will make the Ryazan' GRES the largest in the central portion of the RSFSR, surpassed all standard norms. They were able to accomplish this because of their skilfull use of various engineering discoveries. The chief engineer of the construction administration of the Ryazan' GRES, V. Sorskiy, says that the main housing of the power unit, which is as large as some high buildings, was first rigged from squared frameworks and faced with a light, durable facing material. The prefabricated reinforced concrete structure was erected using the transfer-coveyor method. Some sections were assembled at special areas and then taken by rail to the place where they were to be installed. Here they used a tower crane to lift them and they were welded in 15 - 25 meter sections in stacks. The welded joints provided an enormous benefit. First at a height of several meters they built the enclosures for the laying of the concrete for the joints, and this took four times as much time. One other innovation was used in the construction of the power unit. First the boilers of the thermal stations were installed on sturdy foundations, the construction of which took three months. The 800,000 KW boiler which weighs 24,000 tons was suspended on three powerful ridge beams. This method of installation made it possible for the builders to save another six months. The power unit is being prepared for operation. In the new five-year plan the electrical heart of Ryazan' will become more than two times more powerful. [By V. Gorodetskiy] [Text] [Moscow TRUD in Russian 2 Nov 80 p 1] 8927

UKRAINIAN SOLAR OVEN--In the village of Katsiveli, near Simeiz, they have started the construction of a heliocenter of the Institute of Problems of Materials Science of the UkSSR Academy of Sciences. A solar plant has been operating in the Simferopol' Sportivnaya Hotel for several years; it heats the five-storey building and supplys its hot water. A similar device is in operation at the Yalta Rest Home. The technical and economic justification for a new electric power station with a capacity of 200,000 KW using solar energy has been developed. The scientific-research and planning work has been completed for the creation of an experimental base for the use of the energy of daylight in the suburbs of Alushta. Now the scientists have decided "to entrust" the sun with obtaining ultrapure metals. This is why the heliocenter is being built in Katsiveli, where there is the largest number of days of sunshine. The building and equipment will be installed on hills; the heliostats, just like the caps of sunflowers, will constantly follow the sun, while turning on its axis. The temperature in the focus of the parabolic mirrors will reach 3,500 degrees - this will make it possible to smelt metal at an exceptional chemical purity. In the heliocenter, the construction of which will be done by the Yaltakurortstroy Trust /Yalta Resort Building Trust/, not only materials and alloys will be subjected to testing. The solar energy will help to solve several crucial problems of thermal physics and power engineering and to develop new varieties of high-yield agricultural crops. [By G. Gukasov] [Text] [Moscow IZVESTIYA in Russian 9 Oct 80 p 6] 8927

DRUZHBA OIL PIPELINE--The builders of the Energopol' Association of the Polish People's Republic, who laid the branch of the Druzhba oil pipeline to the Mazheyskiy oil refinery, have completed the last pumping station. The pipeline and its equipment are in operation. Within five years the envoys of the neighboring socialist nation have laid 440 kilometers of pipelines to the petrochemical giant of Soviet Lithuania. Within Belorussia, Latvia and Lithuania they had to cross dozens of rivers and wooded swamps. The workers and specialists of Energopol', equipped with modern technology, have completed their work on schedule and have done a good job. The obelisk, which was opened on 10 October on the road from Ionishkis to Zhagare, near the village of Buyvidzhyay, attests to one more fact of brotherly cooperation between the USSR and Poland. Deputy Chairman of the Lithuanian Council of Ministers, B. Kazanavichyus, congratulated the builders of the branch for their labor victory at a meeting that was held. Attending the meeting were ruling Party and Soviet workers from Ionishkskiy, Akmyanskiy, Birzhayskiy, Mazheykskiy and Rokishkskiy rayons, through which the branch of the oil pipeline passes. Also present were representatives of the Druzhba oilpipeline administration and of other organizations. [Text] [Vilnius SOVETSKAYA LITVA in Russian 11 Oct 80 p 1] 8927

YENIKENDSKAYA GES--Khandar, 5 November. (Azerinform). The first kilometers of the highway connecting Kirovabad with the right coast of Kura near the village of Yenikend have been covered with asphalt. Covering 26 kilometers, the highway will connect autotransport traffic along a path, which in the near future will become one of the most active. At Kura work is getting underway on the construction of the Yenikendskaya GES - the initial station of the Middle Kurinskiy cascade. Near the village of Yenikend an expedition from the Institute of Geography of the Azerbaijan SSR Academy of Sciences has been making visits. The scientists have studied the site of the future station in order to draw up recommendations to prevent the negative impact of the GES upon the environment. In the flood zone, for example, there is a large forested massif. Therefore, the scientists have selected a place for planting new forests. Geologists have studied the river system and zoologists have studied the local fauna. Soil scientists and landscape specialists have also found work to do. The obtained data will be used in drawing up a map, which the scientists will give to the surveyors and planners. The capacity of the new hydroelectric power complex is estimated at 150,000 kilowatts. The capacity of the reservoir will be 140 million cubic meters. [Text] [Baku VYSHKA in Russian 5 Nov 80 p 2] 8927

NEW OIL DEPOSIT IN YAMALO-NENETSKIY OKRUG--Salekhard. Oil workers in the Yamalo-Nenetskiy Autonomous Okrug have commenced the preparation of a reliable, raw material base for the Eleventh Five-Year Plan. The exploitation of the new Karamovskiy deposit has begun. By as early as next year they expect to extract nearly 200,000 tons of oil from this deposit. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 14 Nov 80 p 1] 8927

KOLYMSKAYA GES NEW EQUIPMENT --A critical part of the hydraulic power system - the shell of the unique pipe - has been delivered to the terminal area of the Kolymskaya GES. Its unusual size - six meters high and six meters wide - has created quite a few difficulties for its transport. The final assembly of the shell was accomplished by the brigade that is supervised by the experienced specialist and participant in the construction of the Zeyskaya GES, G. Spirin. The route still to be covered by the part is even more complicated. It must be transported through a tunnel to the installation site and then lifted by a bridge crane into the crater of the unit. Specialists of the Kolymagesstroy Trust have reached an interesting technical solution - to install the shell of the cone by free suspension. [By N. Solov'ev. Magadan] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 26 Oct 80 p 1] 8927

MORE ON PREOBRAZHENKA OIL FIND--Irkutsk Oblast. A powerful oil gusher has spilled from a well near the village of Preobrazhenka, Katangskiy Rayon in northern Irkutsk Oblast. For several years geologists have been prospecting for "black gold" in the severe taiga region. They have drilled more than 20 wells. The new well, and now the most famous of them all, was drilled on 29 June of this year. They worked around the clock, one brigade relieving another. And on an October day, when the shift of drilling foreman Valentin Dmitriyevich Kukarin was on duty, the long awaited "big oil" reached the earth's surface from a depth of 1,600 meters. Igor' Antonovich Kal'vin, chief geologist of the Preobrazhenka oil and gas prospecting expedition, reports that there had been earlier evidence of oil. But the powerful gusher gladdened the hearts of all when it first appeared. According to preliminary estimates, this well is capable of producing 100 tons of oil every 24 hours. For now the drilling continues. According to our forecasts, there should be one more oil-bearing layer at a deeper depth. /Text/ /Moscow SOVETSKAYA ROSSIYA in Russian 26 Oct 80 p 1/ 8927

CHEBOKSARSKAYA GES DAM COMPLETED--Yesterday (15 November) at 0210 hours the final cubic meters of concrete and stones were thrown into the Volga passage; and for the eighth time the Volga River has been subjugated by man. Accross the final small stream from the left shore to the right the first to cross were those who participated in the final stage of the storming effort, Petr Alekseyev, the brigade leader of the drivers, and Klim Grigor'ev, an excavator operator. Nikolay Yegorov, a driver from the right coast storming group, rushed to greet his comrades. The builders of the Cheboksarskaya GES have made a wonderful labor gift. On the eve of the anniversary of the October Revolution, they have begun to flood the trench of the new hydroelectric power giant ahead of schedule. At noon on the 4th of November the sandy dam was broken and the water of the Volga River rushed into the large channel that was created by man. With the flooding of the trench of the tail and then the head race there began a stage of the active damming of the Volga. Over the bridge that had been built to the passage, where only an hour before the last ships of the 1980 navigation season had passed, heavily loaded KrAZ trucks began to move. The trucks were driven by the victors of the socialist competition, including drivers N. Yegorov, Ye. Sobachkin, A. Chugrov, V. Orlov and others. The Volga construction project has settled down to a new taut rhythm - the rhythm of a decisive storming effort. The participants in the Volga storming effort worked hard during the October Revolution holidays. And on 15 November the dam joined forever the right and left shores of the river. The Cheboksarskaya GES is the eighth and final power station on the Volga River. It completes the grandiose hydrocascade on the main river of the RSFSR. The planned capacity of the station is 1,404,000 kilowatts. On 30 December of this year the builders plan to install the first turbine. Another four units are to be installed in 1981. [By special correspondent V. Ovcharov] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 16 Nov 80 p 1] 8927

PETROZAVODSK TETS--At the Petrozavodsk TETS a second power unit, with a capacity of 110 megawatts, has been put into operation. Along with the first power unit, which is in its second year of operation, the TETS at the beginning of October provided power to the Unified Power System of the European USSR. In the Eleventh Five-Year Plan one more power unit will be installed - a boiler and turbine with a capacity of 110,000 KW. [By N. Yuoperi, Petrozavodsk] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Oct 80 p 2] 8927

MEDVEZH'E GAS DEPOSIT--Tyumen' Oblast. The Medvezh'e deposit was the first of the large gas deposits of Siberia to be put into operation. And it has already attained its planned capacity. Every hour the national economy receives nearly ten million cubic meters of the blue fuel from this deposit. Altogether the Medvezh'e deposit will yield 316 billion cubic meters of natural gas during the five-year plan. The workers of the Nadymgazprom Association, which operates the deposit, have won an important labor victory during their pre-congress watch. They have completed their five-year plan. [Text] [Moscow IZVESTIYA in Russian 9 Oct 80 p 2] 8927

DONETSK PLANT OUTPUT OF SUPPORTS--The Donetsk High Voltage Support Plant, which is subordinate to the Energostal'konstruktsiya Trust, has fulfilled all orders from key construction projects of the USSR one month ahead of schedule.. Nearly 15,000 tons of openwork supports, manufactured from Donbass metal, have been shipped to the Chernobyl', Kursk and Rovensk atomic power stations, and the Ryazan' electric power station, for the construction of the Bajkal-Amur railroad and to other well-known destinations. In addition, more than one fourth of all the articles at the plant are manufactured with the State Mark of Quality. This means that less metal is used in them, they are more economical and lighter in processing and assembly. [By S. Tishchenko, Donetsk] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Oct 80 p 2] 8927

NATURAL GAS FROM POLAR REGION--Syktyvkar. The "Northern Lights" gas pipeline is now carrying natural gas from the cold polar deposits to the center of the Soviet Union. And people are tirelessly drilling new wells to keep the river of gas even fuller. Several days ago the drillers-prospectors of Vuktyl, headed by S. Gorchenkov, reported that the Tenth Five-Year Plan assignment for deep operating wells has been fulfilled. Since the start of the five-year plan more than 23.5 kilometers of rock have been drilled. The success of the drillers opens a wide road for the collective of the gas field administration. Competition has gotten underway here under the slogan "to work without anyone lagging behind". And they are working most energetically! The form of competition, a weekly relay of labor affairs that is passed among the operational and production services of the administration, enjoys the special esteem of the gas field workers. For example, service number 3 in passing the baton informs service number 4 that during the week they have extracted 709,000 cubic meters above plan and have recovered 247,000 cubic meters of gas, and that all sectors and watches have overfulfilled their assignments. The best watch was recognized as that of the pumping station watch, headed by G. Kucheryayeva, and also watches of N. Korotchenkov, A. Belousova, O. Lyut'ko and N. Zlunkin. The pre-congress competition is picking up speed. [By P. Novokshonov] [Text] [Moscow IZVESTIYA in Russian 9 Oct 80 p 2] 8927

URALS POWER BRIDGE--Ufa. On the map of Soviet power workers one more powerful mainline has appeared. Straight as an arrow, having crossed the peaks and ridges of the Ural Mountains, the line connects the junctions of the Southern Urals and Bashkiriya with Magnitogorsk and Beketovo. The mechanized columns of the trusts Volgoelektroset'stroy and Tselinelektroset'stroy have installed the final supports on the LEP-500 /high-voltage transmission line7; and the state commission has started working on the line. The length of the manmade river of electricity is not great - 280 kilometers. But what kilometers they were! On any section of the path the builders and installers met with the most unexpected barriers and insidious traps. Their path covered sheer cliffs, deep ravines and a multitude of small mountain streams; in some places there were no natural roads at all. But the experience and mastery of the workers and engineers were up to the task. Sh. Abdurashitov, the supervisor of Bashkirenergo, says that the new LEP is very important to the national economy. The Soviet Union has nearly 100 power systems of which most are connected. However, sometimes the connecting lines are low power lines. This LEP is a strategic one; when it is completed it will be possible to more efficiently and in large amounts, considering the time difference, to transfer energy from the east to the west and vice versa. In addition the line will solve several important problems, which will give the national economy a considerable savings. In particular, the Iriklinskaya GRES, which was built in Orenburg Oblast, still has been unable to operate at its planned capacity, although it has assimilated the capacities. According to specialists, two of its units are "locked" and here is the reason. A significant portion of the energy that the GRES produces is going to the Magnitogorsk junction, where a surplus is created. The new line opens a road to this surplus energy, which can now be transmitted to the center of the Soviet Union. [By R. Bikmukhametov] [Text] [Moscow IZVESTIYA in Russian 9 Oct 80 p 2] 8927

TYUMEN' OBLAST PIPELINES--The workers of the Glavsibtruboprovodstroy /Main Administration for the Construction of Pipelines7 are now completing preparations for the winter construction of the Urengoy to Gryazovets and Urengoy to Petrovsk gas pipelines. Before spring they plan to lay 1,200 kilometers of steel mainline pipelines. The laying of 532 kilometers will be completed before the opening of the 26th CPSU Congress. This past summer steel pipes were delivered to Nadym via a shortened Northern Sea Route for the first time. The giant ships, which were accompanied by the atomic icebreakers, the ARKTIKA and LENIN, proceeded from Murmansk to the Ob' Bay. Here, using floating cranes, the pipes were reloaded onto ships of the Irtysh River Fleet. During the three month navigation season, 90,000 tons of pipes were delivered to Nadym via this route. /Text7 /Moscow SEL'SKAYA ZHIZN' in Russian 2 Nov 80 p 17 8927

VIRGIN LANDS JOIN NATIONAL POWER GRID--Tselinograd. All regions within the Kazakhstan Virgin Lands have been fully connected with the state electric power networks. The construction of the LEP-220 from Atbasar to Sochinskaya has been completed; the line is nearly 100 kilometers long and it has joined the villages of Turgay with the powerful Unified Power System of Northern Kazakhstan. Work on the new power bridge was completed two months ahead of schedule. The collective of the Tselinelektroset'stroy trust has successfully completed an important point of the increased socialist pledges in honor of the 26th CPSU Congress. Altogether it has now laid more than 3,000 kilometers of new rural high-voltage electric power lines - 400 kilometers in excess of the plan. In the Kazakh SSR all grain-growing, sugar beet-growing, cotton-growing and livestock feed growing sovkhozes, as well as poultry farms, have been supplied with centralized sources of energy. As a result, Kazakhstan agriculture is now using one and half times more electricity from state power systems than it did in 1975. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 30 Oct 80 p 1] 8927

OIL FROM BENEATH PERMAFROST--Yakutsk. An industrial flow of oil has been provided by one of the wells that was drilled at the Botuobinskaya oil and gas bearing area by prospectors of the Srednelenskaya expedition. Specialists believe that this oil is comparable in quality to that extracted from the Volgo-Ural oil and gas bearing provice. [By V. Komarov] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 3 Oct 80 p 1] 8927

ZAPOROZH'E PLANT UNIQUE TRANSFORMER--The first one million KV transformer had scarcely left the assembly scaffolding, before the collective of the Zaporozhtransformator Association began and recently completed the first assembly of an even more powerful unit--a three-phase transformer rated at 1,250,000 KV-amperes and a voltage of 330 KV. The unique unit was developed at the Design Bureau of the association in cooperation with the scientists of the All-Union Institute of Transformer Building. It is to be used in the new Southern Ukrainian atomic power station; it will be shipped to the station in the current quarter. [By N. Ivanchenko] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 4 Nov 80 p 1] 8927

MORE POWER FOR FAR EAST--Komsomol'sk-na-Amure (Khabarovskiy Kray). A new LEP-220, the rigging of which began in the tayga, will be carrying the current of the Zeyskaya GES in Komsomol'sk-na-Amure. As if laid by a ruler, a TASS correspondent on board a MI-8 helicopter saw the clearing for the power bridge. The rotary-wing aircraft delivered the first multi-ton supports to the line. The helicopter crews of A. Tsimbalyuk and A. Polozov are skilfully handling their responsibility for aerial installation. In spite of the fact that three powerful thermal electric power plants are now operating in Komsomol'sk, a fourth TETS is being built. More and more energy is needed for the developing area. The current of the Zeyskaya GES will make it possible to speed up the development of natural resources of the Far East. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 11 Oct 80 p 1] 8927

OIL, GAS FINDS IN KARAKALPAK ASSR--Uykus (Karakalpakskaya ASSR). Very recently on the arid plateau Ustyurt they struck a powerful oil gusher. Now they have discovered their own gas bearing layers. Thus, Akchalak is becoming the first oil and gas deposit in the Karakalpakskaya ASSR. In honor of the 26th CPSU Congress, the collective of the deep drilling trust have decided to drill another 1,000 meters and to make it possible for the production workers to start operations. The drilling will be in excess of the plan for the final year of the Tenth Five-Year Plan. [By B. Kuryshev] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 11 Oct 80 p 1] 8927

CSO: 1822

ENERGY CONSERVATION

SOVIETS GO ON DAYLIGHT SAVING TIME

Moscow KRASNAYA ZVEZDA in Russian 7 Nov 80 p 4

[Article by TASS reviewer V. Belyayev: "Time for All"]

[Text] The USSR Council of Ministers has specified a new procedure of time observance. On 1 April of this coming year we shall advance by 1 hour the hands on modest alarm clocks and elegant wrist watches, chiming tower clocks and ingenious-design desktop clocks. This additional hour, if it can be called thus, will be maintained until 1 October.

The USSR Council of Ministers has also ratified a description of the boundaries of time zones. These boundaries take into account this country's administrative divisions. In the future time zone boundaries will be refined by the USSR State Commission for Uniform Time and Standard Frequencies. Its decisions in this area shall be binding on all government administrative agencies, enterprises, establishments and organizations.

The decision to introduce daylight saving time is dictated by the interests of more rational utilization of fuel and energy resources. Power engineers have drawn up dozens of diagrams showing consumption of electricity for lighting at various latitudes. Approximately 28 billion kilowatt hours of electricity are consumed for this purpose each year, which is not a large figure when compared to the total production of electricity. Nevertheless this figure merits respect. In short, power engineers reason as follows: adoption of daylight saving time promises a savings of at least 2.5 billion kilowatt hours of electricity -- 625,000 tons of standard fuel.

Now the only thing left was to find out what the medical experts and trade unions had to say about it. In this case medicine was represented by the Institute of General and Municipal Hygiene imeni A. N. Sysin, which in turn sought counsel with a number of other scientific establishments of the USSR Ministry of Health and the USSR Academy of Medical Sciences. Their opinion is as follows: the existing procedure of time observance should be revised, since it hinders sufficiently full utilization of the daylight hours and is not in conformity with seasonal changes in human biorhythms.

The trade unions also presented their opinion: time adjustment will enable people to spend more time under conditions of full natural illumination and will help improve the state of the people's health.

Therefore this next spring our country, which contains 11 time zones -- from the second to the 12th inclusive -- will adopt daylight saving time. This means that we shall observe time-zone standard time with the clock pushed forward an additional hour from April to October.

3024
CSO: 1822

ENERGY CONSERVATION

IMPROVING HEATING BOILER FUEL ECONOMY

Moscow EKONOMICHESKAYA GAZETA in Russian No 49, Dec 80 p 21

[Article by G. Shaduri, deputy minister of Housing and Municipal Services, Chechen-Ingush ASSR: "Greater Reserves for Fuel Economy"]

[Text] Although municipal power is still called "small-scale power engineering," it has long been one of the largest consumers of fuel and energy resources. Judge for yourselves, since approximately one fourth of the fuel produced in this country is consumed for heating residential and public buildings. It is therefore understandable how important it is that this vast energy potential be utilized as efficiently as possible, with a steady reduction in the substantial energy losses which distinguish municipal from industrial power engineering so adversely.

Certain results have been achieved in this area in recent years. With each passing year there is an increase in the number of cities and towns where heat supply is provided from central heat and electric power plants, where the most economical production of thermal energy is achieved. In areas of mass housing construction there have appeared many large heating boiler facilities containing modern equipment, the efficiency of which approaches that of industrial boiler facilities.

But in older districts, in rural communities, as well as with selective development of small urban districts, one still encounters small boiler facilities with primitive operation and maintenance, where one out of every four or even one out of every three tons of fuel is wasted, going literally up the chimney.

Since many such boiler facilities exist, however, and since they will continue to operate for a long time to come, something must be undertaken to make their operation more efficient. Merely a 1 percent improvement in their efficiency will save the state tens of thousands of tons of fuel annually. A boiler facility will operate highly economically if total fuel combustion (without a large excess of air) is achieved in the boiler fireboxes, while internal heating surfaces which are free of boiler scale ensure good heat transfer.

Not one of these conditions is observed in small boiler facilities. Since there are no combustion process monitoring instruments, the process of fuel combustion at these facilities is practically unmonitored, while operating boilers on untreated water (due to a lack of water-softening equipment) leads to intensive deposition of scale, which causes not only a sharp worsening of heat transfer and elevated temperature of exhaust gases, but also premature boiler failure. It is no secret that at many heating boiler facilities operating on hard water the boilers must be replaced after two or three years of operation.

This can be avoided if boiler facilities are equipped with combustion process monitoring instruments and water-softening equipment. Our industry manufactures such instruments and equipment, but only in limited quantity or in large-model versions designed for big boiler installations. There is a great need to organize the manufacture of instruments and water-softening units which are inexpensive and compact, suited for utilization at small boiler facilities.

But even when boilers are fed soft water, the forming of scale occurs, although not as intensively, and it should be removed at the end of each heating season.

In spite of the considerable labor required and the extent of this work, at the present time there does not exist a sufficiently perfected method of removing scale from the interior heating surfaces of boilers. In most cases this is done by primitive means, with poor quality work, and it frequently occurs that even in boilers operating on soft water accumulation of scale causes failure of the most heavily-worked surfaces by the third or fourth year of operation.

It is high time to develop an improved method of removing scale from the interior heating surfaces of boilers, and low-output boilers in particular, to establish manufacture of the equipment and tools required for such an operation, and to establish within the system of housing and municipal services ministries (following the example of the Ministry of Power and Electrification) specialized organizations (Kotloochistka trusts, for example), the branch units of which could do a skilled job of performing this work locally.

Utilization of the heat of combustion exhaust gases, the temperature of which sometimes is as high as 200 degrees, even in modern heating boiler facilities, constitutes a substantial reserve potential for achieving fuel economy.

Unfortunately, here as well, no suitable method of recovering this enormous quantity of thermal energy has been found. Perhaps the most acceptable technique would be to build a compact water heater, placed at the tail end of the boiler, for additional recovery of heat from the exhaust gases, with subsequent utilization of the heated water in the heat supply circuit or for feeding the boilers themselves. It would present no difficulty for industry to manufacture such water heaters.

Calculations show that a water heater of several square meters, placed in the flow of exhaust gases from a heating boiler of medium size, would be capable of dropping the exhaust gas temperature by 10-15 degrees, which would increase boiler efficiency by one and a half to two percent.

The questions raised here are not new. Utilization of the vast "tailings" of energy resources (and not only of municipal power engineering) has always occupied the attention of experts. But perhaps right now, when the problem of fuel and energy resources is especially critical, it would make sense for the appropriate scientific and design organizations, and in particular the Academy of Municipal Services imeni K. D. Pamfilov, to provide a prompt answer to these questions. This will unquestionably require a certain amount of time and expenditures. But they will be repaid by savings to the state of tens and hundreds of thousands of tons of fuel.

3024
CSO: 1822

FUELS

WESTERN SIBERIA PETROLEUM, GAS PIPELINES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Nov 80 p 1

/Article by G. Yerlykov, Yaroslavl', G. Grinevskaya, Petrovsk, Saratov Oblast, and R. Yevseyeva, Khar'kov: "Paths for Oil and Gas"/

> [Excerpts] The workers of the Ministry of Construction of Petroleum and Gas Industry Enterprises are successfully fulfilling their pre-congress socialist pledges for erecting facilities for the fuel industry. During the past nine months of the concluding year of the five-year plan they have built and put into operation more than 6,500 kilometers of mainline pipelines.
>
> Dozens of compressor and pumping stations and nearly one half million cubic meters of reservoir capacity have been built. More than 2,000 brigades and nearly 40,000 leading workers in the sector have fulfilled their five-year assignments ahead of schedule.
>
> Our outside correspondents report on the progress of work on the fuel lines.

Surgut-Polotsk

One more section of the Surgut to Polotsk pipeline has begun to be filled with petroleum. From Gor'kiy to Yaroslavl' over a span of several hundred kilometers the construction and installation work has been completed. The Yaroslavl' cracking plants will receive the hydrocarbon raw material right after it leaves the Perm' and Gor'kiy oil refineries.

Eighteen technological streams, which were manned by brigades from the Moscow, Voronezh, Bryansk, Ryazan', Kuybyshev and other trusts of the USSR Ministry of Construction of Petroleum and Gas Industry Enterprises, operating by the "working relay race" method, working in difficult conditions have successfully solved their assigned task.

Deserving of special recognition are the "family" collective of Yevgeniy Barauli comprised of four brothers from the Ryazan' Pipeline Construction Trust, the excavator crew of V. Bykov from the Kuybyshev Pipeline Construction Trust, the brigade of welders and overhead welders of V. Dmitriyev from SMU-6 /construction and installation administration/ of the Moscow Gas Pipeline Construction Trust and others.

And now they have added another 400 kilometers to the 2,100 kilometers of pipeline that was previously put into operation. Siberian oil is moving toward Yaroslavl'.

Prior to the opening of the 26th CPSU Congress the collectives of the USSR Ministry of Construction of Petroleum and Gas Industry Enterprises have pledged to complete another 500 kilometers. And then, as they say, the hand will reach Polotsk - the final destination of the pipeline.

Urengoy-Novopskov

The first fifty million cubic meters of gas from the Urengoy and Vyngapur deposits have reached the Donbass. The "blue fuel", having crossed the Northern Ob' River area, the Ural Mountains, and the Volga River area, has completed the final section of the Petrovsk to Novopskov pipeline. This steel artery, which is more than 600 kilometers long, was put into operation within a very short period of time. One of the pledges made in honor of the 26th CPSU Congress has been successfully fulfilled. The new complex will become a crucial link in the Unified gas supply system and will make it possible to more efficiently regulate gas flow rates.

Every 24 hours several million cubic meters of Siberian gas will travel through the pipeline.

From Khar'kov to the West

Gas from the Druzhelyubovskiy field near Khar'kov has begun to enter the international gas transport system "Soyuz". The workers of the Ministry of Construction of Petroleum and Gas Industry Enterprises have completed all work on the bypass of one more Ukrainian field.

The successful implementation of new capacities is the result of an extensive pre-congress competition. Work is proceeding rapidly at the compressor station that is being built at the Krestishenkiy gas condensate field. When it is put into operation it will increase the annual supply of valuable hydrocarbon raw material and fuel from Ukrainian deposits by one and a half billion cubic meters. The builders of SMU-3 of the Ukrvostokneftegazstroy /Eastern Ukraine Trust for the Construction of Petroleum and Gas Industry Enterprises/ trust are working diligently here.

The Mirolyubovskiy, Druzhelyubovskiy and Krestishchenskiy fields in Khar'kov Oblast cannot, of course, be compared with the famous Urengoy and Orenburg fields. Their primary value is that they are located in the center of the Soviet Union's industrial regions. Their inclusion in the main pipelines will provide a noticeable economic gain.

8927
CSO: 1822

FUELS

UDC: 622.276.438

IMPROVEMENT IN PERFORMANCE OF MECHANIZED WATER WELLS AT WESTERN SIBERIAN OILFIELDS

Moscow EKONOMIKA NEFTYANOY PROMYSHLENNOSTI in Russian No 9, Sep 80 pp 12-14

[Article by L. A. Gubnina, L. A. Permyakova, A. V. Pavlova, and O. V. Rudak, Siberian Scientific Research Institute of the Petroleum Industry]

[Text] Improvement in the performance of mechanized water wells -- establishment of optimal flows and improvement in coefficients of operation -- constitutes a significant reserve potential for increasing the effectiveness of utilization of groundwater in the system of flooding producing formations.

At the present time pump-operated water wells total 105, or 54 percent of the total number of operating wells (see table).

Principal Performance Figures on Water Wells

Indices	Natural Flow	Jet Pump	ETsV-10-120-60 Pump	UETsP-16-3000-1000 Pump	Total
Water wells on line	90	53	23	29	195
Water production, million cubic meters	58.5	23.8	20.5	17.7	120.5
Average daily flow of water wells, m^3/day	1660	1614	2108	2482	1822
Coefficient of operation of water wells	0.570	0.560	0.610	0.690	0.607

* As of 1 January 1979

The average daily yield of water wells operated by mechanized means is only 24 percent greater than the average daily yield of natural-flow wells and considerably below the rated productivity of the types of pumps utilized.

The coefficient of operation of well pumps only slightly exceeds that indicator for natural flow and in recent years has shown a declining trend, which is primarily due to an increase in mechanized well downtime while waiting for downhole repair crews, as well as the unreliability of pump units.

One way to achieve efficient utilization of mechanized water wells is selection of economically expedient methods of bringing up groundwater and determination of the limits of their applicability under various operating conditions.

Calculations of the economic indices of the most common mechanized methods of bringing up groundwater in Western Siberian oilfields were performed in order to solve this problem: by jet pump, by ETsV-10-120-60 pump, and by UETsP-16-3000-1000 pump. All mechanized recovery methods were compared with water well natural flow production figures.

A methods solution to the problem included the following stages:

selection of criterion of substantiation of an economically expedient method of groundwater recovery;

substantiation of method with actual water well coefficients of operation;

substantiation of method with equal values of coefficients of operation of water wells;

determination of the area of application of various methods of recovering groundwater on the basis of the obtained results.

Minimum calculated expenditures were adopted as criterion of economic expediency of employment of a given method of producing groundwater.

Methods of producing groundwater are compared on the basis of determination of the following:

capital investment in a given water collection well-cluster pumping station layout;

operating expenditures on carrying out the process of water recovery and transfer;

calculated outlays on groundwater recovery and transfer.

The results of computations of calculated outlays for the various methods of groundwater recovery, in relation to water well flow, obtained for their actual coefficients of operation, are contained in Figure 1. An analysis of these figures indicated that within the yield range up to 1900 m^3/day, natural-flow operation of water wells is the most efficient; within the range 1900-3000 m^3/day, it is expedient to use a UETsP-16-3000-1000 pump as underground cluster pumping station; with yields in excess of 3000 m^3/day -- employment of a jet pump.

In order to place groundwater recovery methods into comparable conditions, analogous computations were performed for identical coefficient of operation values (0.56, 0.57, 0.61, 0.69).

Figure 2 contains an example of comparative analysis of efficiency of employment of methods with a coefficient of operation of 0.69, corresponding to the actual coefficient of operation of a UETsP-16-3000-1000.

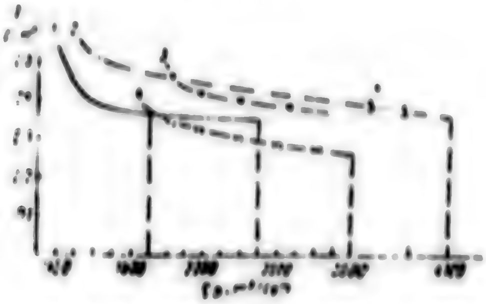

Figure 1. Relationship Between Calculated Outlays and Water Well Flow for Different Methods of Groundwater Recovery (with actual coefficients of operation): Z -- calculated outlays per cubic meter of water, rubles/m^3; q_B -- water well yield, m^3/day; I -- natural-flow production method, with $k_э$ =0.57; 2 -- jet pump with $k_э$ =0.56; 3 -- ETsV-10-120-60 pump with $k_э$ =0.61; 4 -- UETsP-16-3000-1000 unit, with $k_э$ =0.69

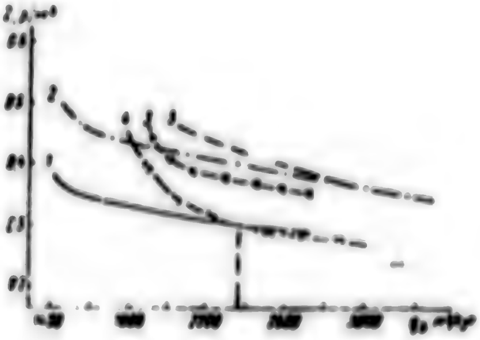

Figure 2. Relationship Between Calculated Expenditures and Water Well Flow with Different Groundwater Recovery Methods, with $k_э$ =0.69

Key:

1. Natural flow
2. Jet pump
3. ETsV-10-120-60 pump
4. UETsP-16-3000-1000 unit
5. UETsP-16-3000-1000 unit with surface cluster pumping station

A nomogram was constructed from the results of these calculations, defining the area of employment of a method in relation to flow and coefficient of operation of water wells (Figure 3).

On the basis of actual figures, the region of employment of the natural-flow method of water well operation is bounded in the nomogram by a flow figure of 1800 m^3/day.

In order to increase the flow in water wells not connected to a surface cluster pumping station, in the range 1800-3000 m^3/day it is recommended that an UETsP-16-3000-1000 be employed as a subsurface cluster pumping station. With a surface cluster pumping station, a flow increase in the range 1800-2080 m^3/day can be achieved by employing jet pumps. A further increase in water well yield to 2088 m^3/day can be obtained by employing an ETsV-10-120-60. Well yields in excess of 2880 m^3/day can be obtained by employing jet pumps.

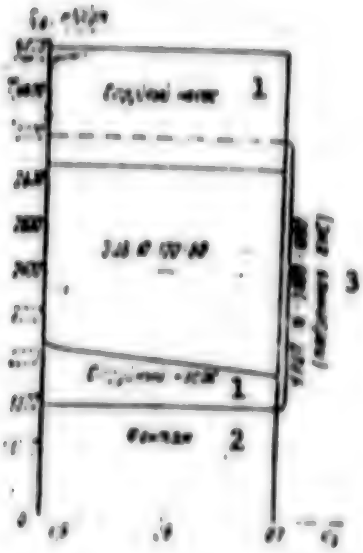

Figure 3. Determination of Area of Employment of Groundwater Mechanized Recovery Methods: k_3 =coefficient of well operation

Key:

1. Jet pump
2. Natural flow
3. Subsurface cluster pumping station

The results of the performed studies are summarized as follows.

Effectiveness in utilizing groundwater to maintain formation pressure can be increased by converting water wells to mechanized operation and selection of the most economical water recovery method.

The region and boundaries of employment of different methods can be determined with the described nomogram. Its utilization for practical purposes enables one to establish optimal water well flows for various operating conditions and to reduce specific expenditures on groundwater production.

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CSO: 1822

FUELS

OIL, GAS EQUIPMENT SUPPLY IN WESTERN SIBERIA

Moscow PRAVDA in Russian 14 Nov 80 p 2

[Article by Candidate of Technical Sciences Yu. Permikin, chairman, Tyumenskaya Oblast Board of the Scientific and Technical Society for Machine Building: "Arctic Model: Problems and Opinions"]

> [Text] This country's principal oil production base has been established in Western Siberia. This region is presently providing half our crude oil production and one third of our natural gas putput. Enormous tasks pertaining to development of this region have been assigned for the immediate future. The more fully the employed methods and scientific-technical means are in conformity with the specific features and conditions of development of the Western Siberian oil and gas complex, the more successfully these tasks will be accomplished.

There is a chart hanging in the office of Yu. Loganov, chief engineer of Glavtyumengeologiya, showing the current status of drilling activities. The graph on this chart looks like a mountain range, with peaks and troughs. One curious item is the fact that drilling crews achieve the greatest productivity with the onset of freezing temperatums. In summer the curve plummets sharply. Why is this?

Last summer was rainy. The ground became swamped in all the oilfields along the Ob'. Dozens of drilling and rigging crews suspended operations: hauling of supplies to the oilfields slowed to a trickle. Oilfield operating and maintenance crews also experienced work stoppages, since lightplane operations were greatly curtailed by the poor weather.

As frequently happens in critical situations, the production people once again turned to science with legitimate complaints and the plea that they be given equipment enabling them to operate year-round and with a high degree of efficiency in these swampy areas.

What kind of a reply can we give? Such equipment exists. Such equipment is protected by more than 100 certificates of invention just in the Western Siberian affiliate of the All-Union Scientific Research Institute for Petroleum Machine Building. But many of the patented ideas have not yet been executed.

Many unique scientific and technical solutions have been originated in Western Siberia. As a result, intensification of production is taking place everywhere, in all branches of the complex. Cluster directional drilling, for example, makes it possible not only to speed up drilling but also to reduce the length of oilfield road systems, oil and gas gathering lines, and power lines.

Extensive utilization of the block-unit method is increasing by 60-80 percent the total volume of construction and installation activities.

A number of efficient solutions have been found in oilfield development technology proper: employment of groundwater to maintain formation pressure and the gas lift production method substantially reduce the number of service personnel and operating costs.

Nevertheless, the designers and builders of machinery for the North have not adequately responded. The oil and gas producers here need fundamentally new equipment, for the scale and conditions are not comparable with those occurring in other parts of the country. Many people understand the term "Arctic equipment" to mean only transport vehicles and hoisting equipment. I believe that the problem must be viewed much more broadly. The term should also include materials utilized in this climatic zone, as well as mineral recovery processes.

This problem was born when intensive exploitation of the northern regions began. At that time experts reached the very disturbing conclusion that the country was losing hundreds of millions of rubles each year due to the inadequacy of machinery, equipment and materials, as well as deficiencies in mining and mineral recovery processes.

We cannot say that no conclusions were drawn after this: equipment which was clearly unsuited was no longer being sent to the North. Laws were passed prohibiting the utilization in the manufacture of Arctic equipment of certain grades of steel which experience failure at extremely low temperatures. Series manufacture began on trucks adapted to the cold weather of Tyumen'. But the problem was that the trucks were only "adapted"....

In order to solve the problem properly, it is necessary not to make improvements but to design and build special vehicles, with the extensive employment of cold-resistant parts, special grades of rubber, and other polymers. Much if not everything in this area of improvement depends on the people in the machine building, chemical and metallurgical industries.

The Ministry of Chemical and Petroleum Machine Building is endeavoring more fully to satisfy the modern equipment needs of the Siberians. They have been succeeding in these endeavors up to the present time. But we do not know how things will progress in the future, since the designed production capacity of the plants has been reached, while the USSR Ministry of Industrial Production is not proceeding to build new ones, particularly in Western Siberia. Today renovation of existing enterprises is no longer enough.

One is particularly concerned by the fact that the drilling, oil and gas field equipment presently being utilized requires considerable live labor outlays. At the present time, for example, in Glavtyumenneftegaz an average of approximately two men per well are required. Within a few years this will become an intolerable luxury, since the total number of operating wells will increase greatly.

The situation in drilling is similar. In coming years the Tyumen' people will be drilling as much as is presently being drilled nationwide by the Ministry of Petroleum Industry. If the average size of the drilling crew also remains at the previous level (approximately 300 men, including service personnel), and if the same applies for specific numerical figures for oil production personnel, an additional approximately 400,000 workers will be needed. It will be necessary to increase the construction worker force to an even greater degree. In addition, one must bear in mind that there already now exists in this region a certain lag in development of the housing and social-services infrastructure, which means that it will be extremely difficult to accomplish the task. All this predetermines the necessity of substantially improving the qualitative level of employed scientific and technical methods.

At the All-Union Conference on Development of Siberia's Productive Resources, held recently in Novosibirsk, basic problems of improving the economic effectiveness of territorial-production complexes over the long term were comprehensively discussed. Sufficient attention was not focused, however, on the role of scientific and technological advances as a decisive condition for increasing production efficiency, either at this conference or in the draft "Siberia" program. Forecasting of growth and development of the oil and gas complex was based on the previously attained level. But this does not ensure successful achievement of the specified performance figures in the coming 5-10 years. A higher level of scientific and technological advance is essential, in conformity with the qualitatively more complex task of the region's oil and gas production industry.

The preconditions for this exist. Take, for example, block-unit construction. With this system, the bulk of assembling and installing operations are performed under factory conditions. Unfortunately at the present time this advanced method is being utilized to a limited extent, although it has been in the process of adoption for more than 15 years now. This is due in large measure to the fact that approximately 30 institutes and subdivisions subordinated to various agencies are working on its development and adoption.

Employment of large-size units, so-called superblocks weighing from 200 to 1000 tons, can produce considerable savings. But for the time being one can only dream about it: there is no way to deliver them to the destination site. We need special heavy-load transport and erection equipment, with good off-road capability and with devices for self-loading and off-loading.

It is true that some steps are being taken in this direction. The Ministry of Petroleum Industry, the Ministry of Gas Industry, and Minneftegazstroy, for example, are punctually assigning tasks to other agencies for the development of such equipment. These projects grind to a halt, however, with equal regularity. One reason for this is poor project coordination on the part of the USSR State Committee for Science and Technology.

Many ministries involved in development of the Tyumen' North are compelled to set up their own machine building enterprises. They do this not because they are so well off financially: technical servicing and repair of equipment, structures and facilities is poorly organized. At the present time up to 30 percent of the total work force is engaged in these activities. Considerable machinery and equipment must be shipped to distant points outside the oblast for repair. For all practical purposes this equipment is off the line for a year or more. In view of the scale of activities in Western Siberia, the machine building ministries need technical servicing and repair facilities locally, on the spot, for oil and gas field equipment, transport equipment and surface facilities. The modular-unit method of erecting facilities will make it possible to replace on the spot from the exchange inventory equipment which has gone out of commission and subsequently to repair that equipment at the factory.

And finally, things should be organized in such a manner that the machine building ministry, in addition to manufacturing basic equipment, would work up standard equipment repair processes, and the test benches, instruments and devices, repair and maintenance facilities required for this purpose. There is a good example of this in Tyumenskaya Oblast: a plant has been built in Surgut for repairing and overhauling Tatra trucks. All equipment and processes were supplied by the manufacturer of these excellent vehicles.

There has long been a discussion of the possibility of building in Western Siberia machine building plants to produce equipment for oil and gas production. And there have been earnest decisions on that score. These projects have not yet commenced, however, due to a low degree of demandingness on the part of USSR Gosplan. It is necessary to establish in Tyumen' a lead scientific-production complex for the development of block-unit process lines designed for the conditions of the North. All this will make it possible more closely to link science with production and to speed up scientific and technological advances in the region.

"Modernization of the basic branches of industry -- power engineering, metallurgy and machine building, chemical and transportation -- should become the core of future economic and social development," stated Comrade L. I. Brezhnev. "Here also we must look ahead at least up to 1990...." This also applies in full measure to the Western Siberian Oil and Gas Complex.

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CSO: 1822

FUELS

ANGREN COAL, KAOLIN PROSPECTS DETAILED

Tashkent PRAVDA VOSTOKA in Russian 9 Oct 80 p 2

[Article by M. Aripzhanov, first secretary of the Angren City Party Committee; Academician S. Ziyadullayev, chairman of the Council for the Study of Productive Resources of the Uzbek SSR Academy of Sciences; Honored Builder of the Uzbek SSR N. Khikmatullayev, director of the Uzgiprotyazhprom Institute; Honored Economist of the Uzbek SSR A. Batygin, doctor of Economic Sciences: "For Comprehensive Development of Angren"]

[Text] The Angren Coal Basin is number one in Central Asia both in total reserves and in production. Reserves exceed 2 billion tons, 80 percent of which can be strip-mined. Angren is currently producing more than half of all Central Asian coal output. And in the future production should double or triple here, reaching 10-15 million tons.

Thick coal seams lying close to the surface result in an extremely low cost of strip mining, which is the most efficient method. Angren coal is the cheapest coal produced in Central Asia. It has a relatively high moisture content, however, as well as low caloric content, which makes it uneconomic to transport this coal to other areas. Therefore the coal should be burned locally, for the most part at thermal electric power stations. The "Principal Directions of Development of the National Economy of the USSR in 1976-1980" state: "Increase generating capacity at thermal electric power stations and build a new GRES fueled by the Angren coal field." Such a power plant is under construction.

In our opinion the most felicitous solution for comprehensive utilization of Angren coal would be to process the coal according to the process developed at the Moscow Power Engineering Institute imeni G. M. Krzhizhanovskiy. With this process, pulverized coal is dried and subjected to heat treatment without admission of air, forming the following: coke fines or semicoke, tar products, fuel gas, and steam. Semicoke is not only an excellent fuel for power generating plants but also is successfully utilized in ferrous and nonferrous metallurgy. Tar products contain benzene, phenol and other valuable substances, while the gas in turn is used as fuel.

By 1990 the generating capacity of the two Angren thermal electric power stations should total 3 million kilowatts. They will consume up to 12 million tons of coal per year. All this promotes power-generation utilization of the coal, which will substantially increase Uzbekistan's resources in cheap chemical raw materials, high-caloric gas, metallurgical process fuel, as well as rare metals, cement and other construction materials obtained from ash.

We consider organization of power engineering research on Angren coal under industrial conditions to be an urgent task. This requires building an experimental-industrial facility adjacent to the Novo-Angrenskaya GRES. In our opinion this important problem can be resolved only with the participation of the ministries of the coal and chemical industry, power and electrification. In our view power engineering research should be headed by the Moscow Power Engineering Institute together with scientific organizations of this republic. Another important problem is development of a group of enterprises based on utilization of kaolin clays, which are used as a raw material for the production of alumina, aluminum, cement, porcelain and other products. Kaolin clays underlie and overlie the coal deposits and are mined along with the coal. Kaolin clay reserves exceed 8 billion tons, and in the future production will increase to 20-30 million tons per year. Such a vast quantity of cheap and valuable raw material opens up considerable opportunities for its extensive utilization.

It is our conviction that there should be continuation of technical-economic research and substantiation of comprehensive processing of the kaolin clays, including setting up production of alumina from waste material at the Akhangaran Cement Plant. Organization of alumina production on a large scale will make it possible to establish a new industry for Uzbekistan -- aluminum industry. At the first stage, the Regar Aluminum Plant in Tadzhikistan can be supplied with Angren alumina; at the present time raw materials are being hauled in from distant sources at considerable cost. An alumina-cement combine specified for future construction in development plans for Uzbekistan's productive resources will supply cement not only to our republic but all of Central Asia as well. Angren kaolin will be used in the production of white decorative cement, which can be turned out in any color. Its extensive employment in construction will beautify our cities and villages. At the present time there is a plant in Angren producing white cement, but its output capacity cannot even meet this republic's minimum requirements.

Also very important is a severalfold increase in the manufacture of ceramic tiles, facing tiles, vitreous floor tiles and facade tiles by enlarging and renovating the Angren Ceramic Combine. In addition, to achieve comprehensive utilization of kaolin clays it is advisable to build enterprises for the production of refractories, high-voltage porcelain insulators, porcelain ware, as well as a large concentration complex, which would make it possible not only to utilize raw materials locally but also to export kaolin on a commercial basis to other republics.

Comprehensive utilization of kaolin clays will make it possible to save a considerable quantity of valuable commercial minerals. Since the coal mine went into operation, approximately 50 million tons of kaolin has been hauled away to the spoilbanks. This quantity would be sufficient for the production of several million tons of alumina and aluminum, 48 million tons of high-grade cement, as well as many other products worth a total in excess of one and a half billion rubles. The cost of building a complex of enterprises using kaolin clay as a raw material would be repaid in five or six years, while at the present time hundreds of thousands of tons of refractory brick, high-voltage porcelain, and clay are being hauled to Uzbekistan from the Ukraine and from the RSFSR.

The problem of comprehensive utilization of Angren kaolin is of great significance for the national economy. Resolution of this problem should obviously be considered one of the most important tasks of the Uzbek SSR to be submitted for examination at the 25th CPSU Congress, with the objective of drawing up and executing in the 11th Five-Year Plan a specific, comprehensive scientific-technical program of utilization of the Angren kaolin clays.

Alongside the heavy industry branches, a very important problem is further development of light industry enterprises, which would make it possible to satisfy the requirements of the population of this mining and industrial area in mass-demand goods and to broaden the area of utilization of female labor. It would be advisable for this republic's Ministry of Light Industry to consider building its own enterprises in Angren.

The program of further development of the Angren Industrial Region should also include the establishment of a solid agricultural base around the cities, towns and worker communities. To accomplish this, it is necessary first of all to resolve the problem of water supply. It is essential to speed up construction of the Akhangaran and Dzhablanskoye reservoirs, providing year-round control of water flow, as well as dams across the major tributary valleys of the Akhangaran Valley. All this will make it possible to meet industry's water requirements and will create conditions for expanding irrigation farming in this area to 30-40 thousand hectares.

Growth and development of orchards and vineyards throughout the area, both on the valley floor and on the mountain slopes, will make it possible to supply the population with fruit and grapes, will transform the natural environment, will beautify the landscape and will improve the climate. Construction of reservoirs will create new recreation opportunities for workers and their families. All this, together with an extensive program of housing and cultural facilities construction, will make it possible to accomplish the program of further improvement in living standards and working conditions.

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CSO: 1822

FUELS

ARMENIAN INDUSTRY ACHIEVES ECONOMIES

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 80 p 3

[Article by group correspondent EG, staff of newspaper YEREKOYAN YEREVAN: "In Search of Reserves"]

[Text] Competing to honor in a worthy manner the 26th CPSU Congress, the work forces of the enterprises and construction projects of Yerevan have initiated a mass movement to utilize reserve potential to achieve better efficiency and quality. An example is being shown by the work force at the chemical reagent plant. Labor productivity at this enterprise has increased by 77 percent since 1975, which made it possible to achieve ahead of schedule the five-year-plan target for this most important indicator.

There are no lagging workers at the specialized installation and setup administration of the Sevkavspetsavtomatika Association. At the suggestion of the workers, a setup section has been organized here, and arrangements have been made for providing brigades with everything they need for uninterrupted work activities. This created a foundation for competition for achieving record output per installation worker. Labor productivity has increased by 48 percent in this work force since the beginning of the five-year plan, as compared with the targeted 35 percent.

The brigade form of organization of labor and wages at the enterprises of this city has been very helpful in the campaign to improve work efficiency and quality. The workers at the Armelektrosvet Association pioneered its adoption.

Pre-congress pledges specify shifting 61 percent of the workers over to the brigade form of organization of labor and wages at Armelektrosvet. Already more than half of the employees are working on unified schedules.

With the assistance of experts at the Yerevan Institute of the National Economy, a brigade hourly wage plus bonus pay system, with normed work quota, based on the experience at VAZ, was adopted on automotive lamp assembly lines at the lead plant.

During these pre-congress labor watch days, an initiative by aluminum plant anode operator brigade leader P. Nazaretyan -- "All above-target production exclusively on the basis of economized raw materials and energy resources" -- evoked strong response in this city. Savings of primary aluminum at the plant ran into the hundreds of tons. Engineer support of the thrift movement was set up here in cooperation with the scientists at a number of institutes.

The search for reserve potential for achieving above-target production is proceeding in various directions. At the Yerevan Automotive Plant they are holding a contest for the best suggestions for achieving savings in raw materials, supplies, and energy. Workers, foremen, and engineers have come up with many novel ideas. For example, changing the configuration of a bracket part is helping save 13.5 tons of sheet steel annually. Efficiency innovators in the press forging shop, seeking to achieve gas savings, designed a special cutoff device with remote control.

A search for possibilities to turn out production from economized materials at the Yerevan Elektropribor Association is equally intensively in progress. Designers in the chief process engineer division have suggested replacing point contacts in instrument terminal blocks with shaped plate contacts, which can be stamped out. As a result, shift productivity increased by 150 percent.

Recently the Central Committee of the Communist Party of Armenia gave its approval of an experiment performed by the shoe workers at the Masis Association aimed at increasing the manufacture of top-quality items. This work force is seeking to produce elegant, stylish shoes at the lowest possible cost. Hundreds of workers have personally achieved savings.

3024
CSO: 1822

BASHKIR OIL WELL DOWNHOLE MAINTENANCE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Nov 80 p 1

[Article by V. Antonov, engineer at the Bashneft' Association, Ufa: "Team from the Southern Arlan"]

[Text] The beam pumping unit, which had just been operating satisfactorily, suddenly ground to a stop, poised over the wellhead. Sooner or later this had to happen, but a breakdown is always unexpected. Such shutdowns require immediate actions, for even a short period of well downtime will affect crude oil production figures.

I. Dunayev's crew, in whose section the breakdown occurred, should have immediately gone to work, it would seem. This crew is famous in the Yuzharlanneft' Administration for its high degree of skill and efficiency. But only equipment operator S. Mekhovnikov arrived at the site. He placed his tractor with the mounted derrick and proceeded to secure anchor cables.

"Where are the rest of the duty crew?" I asked him.

"Everything in its time," he calmly replied, continuing to tighten fasteners.

As soon as he finished the job, Ivan Il'ich Dunayev drove up, a broad-shouldered, rugged-looking fellow about 30 years of age. The other members of the crew also began arriving. I thought to myself: they are not in much of a hurry to correct the problem. They are leisurely strolling up, and the foreman, who is witnessing it, remains silent.

Only later did I learn why the maintenance crew members did not all arrive at once. They were busy working on a neighboring well, and each man hurried over as soon as he completed his job there. In fact, each man would appear precisely when it was time for him to begin his job. An unwritten principle was in operation: as soon as you finish your job at one site, proceed to the next site without delay.

I. Dunayev's crew has been maintaining this unique style in work organization for several years now, and it has always paid off. Precisely because of this distribution of manpower, they are able to achieve a sharp increase in productive time. The brigade is divided into three duty crews, and a sliding schedule has been drawn up. When a red warning lamp lights up on the console in the dispatcher room, at the administrative offices, the members of the duty watch crew go out, day or night, to perform repairs.

But let us return to the well, where the foreman and his men were now working in a smooth rhythm, each member of the team performing his operations knowledgeably and without haste. Raising of the rod sections was proceeding smoothly; the elevators caught hold of them one after the other. Finally the broken rod length was replaced with a new one. The beam unit resumed operation and proceeded to pump oil out of the formation.

When the job was finished, Dunayev discarded his gloves and drew from his pocket a tattered notebook. It contained entries indicating on what well and when a pump or rod had been replaced, and how many hours the repair had taken. This would come in handy for the future: a complete analysis could be made, both of the quality of the equipment and of his men's job performance.

The brigade services more than 140 wells. In the conditions of the Southern Arlan such a large number can be handled only by a work force which has mastered all the finer points of downhole well maintenance. Unexpected surprises arise each time another well must be "cured." Sometimes the watch crews, relieving one another, work more than 30 hours on correcting the problem.

The brigade accomplished its five-year plan target in March, having performed maintenance repairs on approximately 700 wells. An average of 7 hours was saved on each. Productive time amounted to 98.5 percent.

"What is the secret of this success?" I asked Ivan Il'ich.

"Everything must be taken as an integrated whole -- organization of labor, training the men, and utilization of equipment," he replied. "Take a look at this, for example," said Dunayev, pointing to KMU-1 tongs. "They are heavy, close to half a ton. Not all downhole maintenance brigades use such a device. But we took an immediate liking to it. We thought about it, and built a turntable on a tool sled. We use it to feed tongs to the wellhead."

Dunayev observes the following rule: if he sees anything useful employed by another crew, he will definitely adopt it for his own brigade. He has learned a great deal from his mentor, senior foreman A. Masyagutov. He has gone to Dyurtyuli, where USSR State Prize recipient A. Basyrov, downhole maintenance expert, works. While he was there he borrowed several implements. And the brigade itself has fabricated quite a few special tools. The foreman has taught all his men to take good care of the equipment, and therefore the tools and equipment are always sparkling clean. They have mastered many related occupational specialties -- this is very important for speeding up the job. Particular care is devoted to preparations for repair activities. Everything is provided for down to the tiniest detail, and each man knows in advance what he will be doing.

The brigade highly guarantees a well on which they have finished working. Wells operate more than 300 days without shutdown between repairs, while the average for the administration is 250 days.

...The oil wells of the Southern Arlan are located in remote swampy areas, along the edge of woodlands, and on hillsides. Some are not always accessible. But the maintenance crews are honorably standing pre-congress shock-work duty watch.

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